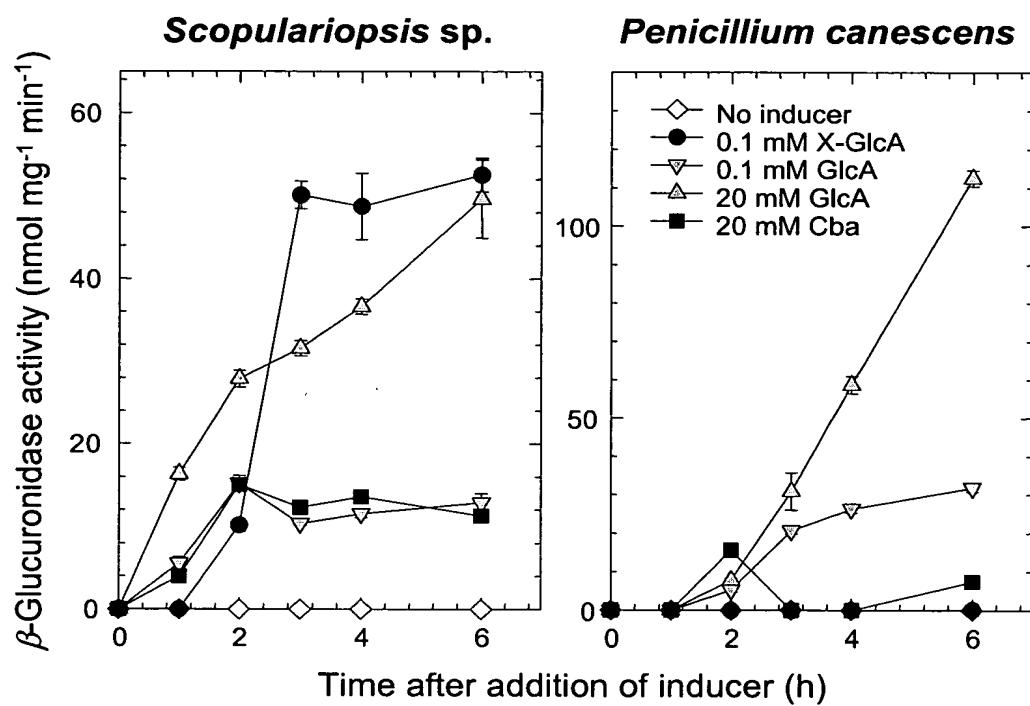


**Figure 1**



## Figure 2A

### *Socpulariopsis* sp. isolate RP38.3

1 GATATTGAGA GCACTTCT CTGTATGT GATGAGGAAG GGCAGCGAAA TGAAAAAAA AAAAAAA  
 71 AAAAGCCGG GTTGACAAAC CCTGGCCTCG GCTTACATA CACTAAAGTG ATAGATCTGG ATGTACATT  
 141 ATACGTGACG ATCTCCGGG TCTATTCCGC TGTTCATTAC CATTCACTCG GTGCACTGGC  
 (dA)<sub>8</sub>  
 211 CTTGCGAACAA AAAAAAATGC TGTCGTGTGT TACCCGACTA CCATGCTTCT ACTCATTTT CGGGGATTTC  
 281 GGAATCCAGT ATGCCGGAC GGACTGTAAG TTGTAAGAAA GTTCTGACAA ATACAGAAA TCGGGGGAGT  
 351 GGAAGTCAA TTGAATGTGG AGAAGAAATG CGAGGTCTCA GATGGGGAA TCTTGTAGAC TCTGCAAAGA  
 421 GCAGAAAGTGC GGAAAACACCG GAGAAGAGGA GGGGGAGAC TGCGGATAAG ACAAAGGGTA AGTGTATCTC  
 491 GAGGTGTGTC TATTGGGAA TAGTGTACAT CATAGGCAC CTCATAGGA AACCAACCGAG TCAAACCCAT  
 TATABox (dA)<sub>10</sub> →  
 561 GACTATATGA AGAGGGACG ATCTCGA AAAAAAGAGA AGAGCACAAAC ACCTCCAGCC AGAGCAACCT  
 M R L S N I P L L R P W A A L  
 631 GAGCCGTCAA CTCCCTGCTT GTCCATCATG CGCCCTCTCTA ATATCCCCCT TCTGCGCCCT TGCGGCCGCTC  
 S L A T L I G L S S G A D T D Q W K T L K P Q  
 701 TGTCCCTAGC CACCCCTCATC GGGCTGTCCCT CTGGTGGCCGA CACTGACCAA TGGAAAGACGCG TCAAAGCCCA  
 A N A I R E L L S I D G T W N F A L P Q S R E  
 771 AGCTAAATGCT ATTGGGAGC TACTCTCCCT TGATGGTACCG TGGAAACTTTG CCCTCCCCA ATCACGCCAA  
 I E D Q G W T S V I P P K L Q I P V P A S Y N  
 841 ATTGAGGAAG ACCAGGGCTG GACTAGCGTT ATTCCACCCCA AACTGAAAT CCCAGTGGCC GCCAGCTACA  
 D I F T D P A I R N N V G W A Y Y Q R H A I V  
 911 ACGACATCTT CACCGATCCCG GCGATCCGGA ACAACGTTGG CTGGGCATAC TATCAGGGCC ACGCCATTGT  
 P Q T W S E G R Y Y V R F D S V T H E A K V Y  
 981 CCCCCAGACC TGGTCTGGGG GACGCTACTA TGTTCGCTTC GACTCTGTTA CGCACGGGG CAAGGTCTAC  
 V N D E E V G G H V G G Y T P F E V D L T D L V  
 1051 GTCAACGACG AGGAAGTCGG AGGCCATGTC GGTGGATATA CTCCCTTCGA GGTTGACTG ACCGACCTTG

**Figure 2B**

|      |   |
|------|---|
| 1121 | TGTGCCCG AGGCAAGTTC CGCCTGACTG TTGCTGTCAA CAATATCCCTG ACTTGGCAGA CCATCCCC   |
| 1121 | <b>G</b> <b>E</b> <b>V</b> <b>V</b> <b>T</b> <b>N</b> <b>E</b> <b>A</b> <b>G</b> <b>K</b> <b>L</b> <b>R</b> <b>Q</b> <b>D</b> <b>Y</b> <b>N</b> <b>H</b> <b>D</b> <b>F</b> <b>Y</b> <b>N</b> <b>Y</b> <b>A</b>          |
| 1191 | GGTGAGGTG GTGACCAACG AGGCTGGTAA GCTTGGACAG GACTACAACC ACGACTCTCA CAACTACGCT   |
| 1191 | <b>G</b> <b>T</b> <b>A</b> <b>R</b> <b>S</b> <b>V</b> <b>S</b> <b>L</b> <b>Y</b> <b>S</b> <b>V</b> <b>P</b> <b>D</b> <b>V</b> <b>H</b> <b>V</b> <b>S</b> <b>D</b> <b>V</b> <b>T</b> <b>V</b> <b>T</b> <b>T</b> <b>E</b> |
| 1261 | GAATTGCAC GTTCCGGTCTC GCTATACTCC GTGCCCTGATG TTCATGTTAG CGACGTCACT GTTACTACCG   |
| 1261 | <b>N</b> <b>N</b> <b>D</b> <b>D</b> <b>E</b> <b>G</b> <b>N</b> <b>E</b> <b>G</b> <b>T</b> <b>V</b> <b>N</b> <b>Y</b> <b>S</b> <b>V</b> <b>E</b> <b>T</b> <b>S</b> <b>G</b> <b>S</b> <b>N</b> <b>D</b> <b>T</b> <b>Q</b> |
| 1331 | AGAACGACGA CGAGGGCAAC GAGGGCACCG TCAACTACTC TGTCGAGAAC AGCGGGTCTA ACGACACTCA  |
| 1331 | <b>A</b> <b>R</b> <b>V</b> <b>T</b> <b>L</b> <b>I</b> <b>D</b> <b>E</b> <b>D</b> <b>G</b> <b>N</b> <b>E</b> <b>V</b> <b>A</b> <b>E</b> <b>A</b> <b>S</b> <b>E</b> <b>L</b> <b>E</b> <b>G</b> <b>S</b> <b>L</b>          |
| 1401 | GGCTAGGGTC ACTTGTATTG ATGAGGACGG CAACGAGGTC GCCGGAGGCAT CGGAGCTGGA GGGGAGCTTG   |
| 1401 | <b>N</b> <b>V</b> <b>S</b> <b>P</b> <b>V</b> <b>N</b> <b>L</b> <b>W</b> <b>Q</b> <b>P</b> <b>G</b> <b>A</b> <b>A</b> <b>Y</b> <b>L</b> <b>Y</b> <b>T</b> <b>L</b> <b>R</b> <b>V</b> <b>E</b> <b>L</b> <b>L</b> <b>S</b> |
| 1471 | ACGCTGAGCC CCGTGAATCT CTGGCAGCCG GGCGCGGGGT ACCTCTACAC TCTTCGGCTT GAACTCCTTT  |
| 1471 | <b>D</b> <b>D</b> <b>T</b> <b>V</b> <b>V</b> <b>D</b> <b>T</b> <b>Y</b> <b>D</b> <b>L</b> <b>P</b> <b>V</b> <b>G</b> <b>V</b> <b>R</b> <b>S</b> <b>V</b> <b>R</b> <b>V</b> <b>E</b> <b>G</b> <b>N</b> <b>Q</b>          |
| 1541 | CGGACGATAC CGTCGTCGAC ACTTATGATT TACCGGGTGG TGTACGGTCC GTTACGGTTG AAGGAAACCA  |
| 1541 | <b>F</b> <b>L</b> <b>I</b> <b>N</b> <b>G</b> <b>K</b> <b>P</b> <b>F</b> <b>Y</b> <b>F</b> <b>T</b> <b>G</b> <b>F</b> <b>G</b> <b>K</b> <b>H</b> <b>E</b> <b>D</b> <b>S</b> <b>P</b> <b>V</b> <b>R</b> <b>G</b>          |
| 1611 | GTTCCTCATC AACGGCAAGC CCTTCTACTT CACCGGCTTT GGCAAGGCAG AGGACAGCCC CGTCGGGA  |
| 1611 | <b>K</b> <b>G</b> <b>Y</b> <b>D</b> <b>P</b> <b>A</b> <b>Y</b> <b>M</b> <b>I</b> <b>H</b> <b>D</b> <b>F</b> <b>E</b> <b>L</b> <b>M</b> <b>K</b> <b>W</b> <b>M</b> <b>G</b> <b>A</b> <b>N</b> <b>S</b> <b>F</b> <b>R</b> |
| 1681 | AGGGCTACG ACCGGGCCATA CATGATCCAT GATTTGAGC TCATGAAGTG GATGGGGCC AACTCCTCC   |
| 1681 | <b>T</b> <b>S</b> <b>H</b> <b>Y</b> <b>P</b> <b>Y</b> <b>A</b> <b>E</b> <b>E</b> <b>V</b> <b>M</b> <b>E</b> <b>Y</b> <b>A</b> <b>D</b> <b>R</b> <b>H</b> <b>G</b> <b>I</b> <b>V</b> <b>V</b> <b>I</b> <b>D</b>          |
| 1751 | GGACCTCCCA CTACCCCTAC GCCGAGGGG TCATGGAGTA CGCCGACCGT CACGGCATCG TCGTCATCGA   |
| 1751 | <b>E</b> <b>V</b> <b>A</b> <b>A</b> <b>V</b> <b>G</b> <b>L</b> <b>N</b> <b>L</b> <b>G</b> <b>I</b> <b>S</b> <b>A</b> <b>G</b> <b>L</b> <b>R</b> <b>G</b> <b>D</b> <b>E</b> <b>P</b> <b>P</b> <b>K</b> <b>T</b>          |
| 1821 | CGAGGTGGCC GCCGTGGTC TGAACCTGGG CATCAGGGCA GGCCTCAGGG GACATGAGCC GCCAAAGACC   |
| 1821 | <b>F</b> <b>T</b> <b>E</b> <b>D</b> <b>K</b> <b>V</b> <b>N</b> <b>N</b> <b>E</b> <b>T</b> <b>Q</b> <b>K</b> <b>T</b> <b>H</b> <b>A</b> <b>Q</b> <b>A</b> <b>L</b> <b>R</b> <b>E</b> <b>L</b> <b>I</b> <b>H</b> <b>R</b> |
| 1891 | TTACGGAGG ACAAGGTTAA CAACCGAGACG CAAAAGACAC ACGCCAGGC CCTCCGTGAG TTGATCCACC   |
| 1891 | <b>D</b> <b>K</b> <b>N</b> <b>H</b> <b>A</b> <b>S</b> <b>V</b> <b>V</b> <b>S</b> <b>W</b> <b>C</b> <b>V</b> <b>T</b> <b>N</b> <b>E</b> <b>P</b> <b>A</b> <b>S</b> <b>A</b> <b>E</b> <b>D</b> <b>G</b> <b>A</b>          |
| 1961 | GTGACAAGAA CCACGCCCTCC GTTGTCACTC GTTGTCACT GGTGGCTCAC CAACGAGCCCC GCCTCCGGCC AGGACGGTGC  |
| 1961 | <b>R</b> <b>E</b> <b>Y</b> <b>F</b> <b>Q</b> <b>P</b> <b>L</b> <b>V</b> <b>E</b> <b>L</b> <b>T</b> <b>R</b> <b>E</b> <b>L</b> <b>D</b> <b>P</b> <b>T</b> <b>R</b> <b>P</b> <b>V</b> <b>T</b> <b>F</b> <b>T</b>          |
| 2031 | CCGGGAGTAC TTCCAGCCCC TTGGTCGAGCT AACCCGGAG CTGGACCCCA CCCGGCCCCGTTGATCCACC   |
| 2031 | <b>N</b> <b>V</b> <b>M</b> <b>G</b> <b>A</b> <b>T</b> <b>V</b> <b>D</b> <b>K</b> <b>C</b> <b>L</b> <b>I</b> <b>S</b> <b>D</b> <b>L</b> <b>F</b> <b>D</b> <b>F</b> <b>L</b> <b>S</b> <b>L</b> <b>N</b> <b>R</b> <b>Y</b> |
| 2101 | AACGTCACTGG GCCGCCACCGT CGACAAAGTGC CTCACTCTCCG ATCTTCTCGA CTTCCCTTCT CTCACCGCT   |

Figure 2C

|      |             |             |              |             |             |                  |                |
|------|-------------|-------------|--------------|-------------|-------------|------------------|----------------|
| 2171 | ACTACGGGTG  | GTACGTCCAA  | ACGGCGGAC    | TGGAGTCCGC  | CGAGGTCGCC  | ATGGAGGAGG       | AGCTCCTCCA     |
|      | W V D       | E Y D K     | P I I        | M S E       | Y G A       | D T L A          | G L H          |
| 2241 | GTGGGTCCAC  | GAGGTGACA   | AGCCTATCAT   | CATGTCGGAG  | TACGGCGCCG  | ACACCCCTGGC      | CGGTCTCCAC     |
|      | A V D       | E V L W     | S E E        | Y Q T       | N L         | R M S H          | K V F D        |
| 2311 | GGGGTCGACG  | AGGTGCTCTG  | GTCCCAGGGAG  | TACCAAGACCA | ACCTCCTGCG  | CATGTCGAC        | AAGGTCTTTC     |
|      | S I D       | S I V G E H | V W N F      | A D F       | Q T P H     | T G V            |                |
| 2381 | ACAGGATTGA  | CTCCATTGTT  | GGCGAGGCCACG | TGTGGAACTT  | TGCTGATTTC  | CAGACTCCTC       | ATACTGGTGT     |
|      | N R V       | D G N K     | K G V        | F T R       | E R R       | P K A A          | H E            |
| 2451 | CAACCGTGT   | GATGGAAACA  | AGAACGGGTG   | GTTTACGGGT  | GAGGGAGGC   | CTAAGGCCGC       | GGCACATGAG     |
|      | L K R       | R W L D     | E G F        | P K L       | G N G       | T S G A          | *              |
| 2521 | CTCAAGAGGC  | GTTGGCTGGA  | CGAGGGGTTC   | CCGAAGCTGG  | CGAACGGTAC  | TTCGGGTGCT       | TAAGTGGAGC     |
|      | ACGGGTATGA  | TAGGGTTAA   | CTGCCAAGAT   | ACATAGGGCA  | GAGGTTTTAG  | TGACATACAC       | CTGTGAGAT      |
| 2591 | CTGGAATTAA  | CGCCGTATGA  | ATTGCTGTAT   | GACTTATGC   | CAAGGACTTG  | TTGGCCTATCT      | AATACTTGT      |
| 2661 | AGAAAGCTAG  | TGCTGTGCCGT | GATTGCGAAG   | GGGGCTTTAA  | GTCACCCAAAC | CTGGATCAA        | GACATTATTC     |
| 2731 | CACTATATCA  | CAACTTCATG  | AGTACGGAGTG  | GGGATTGAAA  | GCAAACGGTC  | GGGAACTCTA       | CTCGGCAGCC     |
| 2801 | GCGACTTGG   | GCCAAGTTTG  | AGAAAAGGGC   | CATGTTTCGA  | GGTTATGATT  | CGGAAGTCTA       | TACATTAATA     |
| 2871 | CAAGGTGCC   | TGGCTCTGTTA | AACCCCTCT    | CACTCGCTT   | TAAAGACGC   | ACAGGGCCAT       | TTTGTGCCCT     |
| 2941 |             |             |              |             |             | Poly (da) signal | Poly (da) site |
| 3011 | TAACCTCTGAA | GACGTTGTTA  | GAATAAAAAGT  | GGTGGAGCCA  | GCTGCCCTACG | CCTAGTTGGC       | CAGTCTCCA      |
| 3081 | GTTCCTCCACT | TGCAAGCTAA  | TCCTGAGGAA   | AAGCTTGCAGC | CGGTGAAGC   | CCGTTCCGTT       | CTGCGTGAAG     |
| 3151 | TTTAGTATCC  | TAACTAAGCA  | CGTACGGTAA   | AATCTCGCC   | GTGGCCGTGCC | ACCTTGTGTTG      | GATCGTCAGC     |
| 3221 | AACTCGTAA   | ATCCCGCACT  | TGATTTTACT   | AAAACGAGA   | CCTTTTACAT  | TCTGGAGTTG       | ATACCCGGGC     |
| 3291 | GTATCCGCCA  | ACGTCGTNCH  | NNNCTTTTGN   | CCCTCATACA  | GGGCCGTTAC  | AAGCC            |                |

**Figure 3A**

***Penicillium canescens* isolate RPK**

|     |            |             |             |             |             |             |             |     |
|-----|------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|
| 1   | GCCAAGCTCA | TCAGTCACCG  | ATGAAAAACT  | ACTCAATTGC  | CGATGCATCG  | TCTGGAAAC   | TATATAATG   |     |
| 71  | CCTAAGTGCA | GCCAGATATA  | ATACCCCTCAT | CAACTTAC    | TATA box    | TATA box    |             |     |
| 141 | ATTACCCCTT | ATAAAGCGG   | CAATGAATT   | CCTAACGGGA  | TTGTCTCGTGC | TGTCTCTTGC  | TGGTCCCATCG |     |
| 211 | TTGGGTACAC | CTGCAAGCTCG | GCACCTTCCA  | CGCAATGAAA  | TGACCCAAACA | TGAACAGCCC  | TTGATCAAAG  |     |
| 281 | R P Q      | R T S       | S R E       | L V N L     | D G L       | W K F       | A L         | A S |
| 351 | G L N      | D T A       | Q P W T     | A P L       | P K G       | L E C       | P V         | P A |
| 421 | TGGCCTCAAT | GACACGGCCC  | AACCGTGGAC  | AGCGCCATTAA | CCCAAAGGTC  | TIGAATGTCC  | AGTCCCCGGCC |     |
| 491 | TCTTACAACG | ACATCTTCAT  | CAGCCGGGAG  | ATTCAACGACC | ATGTGGGATG  | GGTTTACTAT  | CAGCGTGAAGG |     |
| 561 | TCAATTGTC  | CCCAGGCTGG  | TCTCAGGAGC  | GATATCTCGT  | GCGAGCCGAA  | TCCGCTACGC  | ACCATGGTCG  |     |
| 631 | TCCCACCTGG | AAAATCAACG  | ACAGGGAAACG | CGACTGGCAA  | GAGAATCCAG  | ACCTATCAAAC | ATGACTTTA   |     |
| 701 | N Y A      | G L A R     | S I W       | L Y S       | V P         | Q Q         | D I         | T   |
| 771 | CAACTATGCT | GGTCTCGCCC  | GATCTATCTG  | GCTTTATTCT  | GTACCCCGC   | AACATATCCA  | GGATATTACT  |     |
| 841 | GTGGTACAG  | ATGTTGATGG  | TGACAATGGT  | CTGATTAAC   | ACGAGGTGGA  | AGTGGCCAAC  | CAGACCGACCG |     |

Figure 3B

|      |  |   |
|------|--|---|
| 911  | GGCAGATCCA GATCTCAGTG ATCGACCGAGG  | ATGGAGCTT V A K A S G A Q G T               |
| 981  | TGTCACAAATT CCCTCAGTCA AGCTATGGCA ACCTGGGCC                                    | GCATATCTCT ACCAACTCCA GGTCAACATC            |
| 1001 | V G S S G D V V D T Y N L A T G V R T V K V A G                                |   |
| 1051 | GTGGGTTCTA GCGGGATGT AGTCGACACC  | TACAATTGG CTACGGCGT GCGTACTGTC AAGGGTGGCG   |
| 1121 | GGTCACAAATT CTTAATAAAAT GGAAAAGCCTT  | TCTACTTTAC CGGTTTGGC AAACATGAAG ACACAGCAGT  |
| 1191 | R G K G H D P A Y M V H D F Q L M K W I G A N                                  |   |
| 1261 | S F R T S H Y P Y A E E V M D F A D R N G I V V                                |   |
| 1331 | TCTTTTCGGA CTTCACACTA TCCTTACGCG   | GAAGAGGTCA TGGATTTCGC AGATCGAAAT GGAATTGTCG |
| 1401 | T D E T P A V G L N I A L M G V S E S G A P Q                                  |   |
| 1471 | TGATCGATGA AACACCTGCC GTTGGTCTGA ACATGGCCTT GATGGGGTA TCTGAGAGTG GTGCCCAACA    |   |
| 1541 | T F T P D A I N D K T Q E A H K Q A I R E L I                                  |   |
| 1611 | AACATTAG CCAGATGCC TTAACGATAA AACCCAGAG GCCCACAGGC AGGGGATTGC TGAGCTCATT       |   |
| 1681 | A R E Y F E P L T N L T R Q L D P T R P I T F                                  |   |
| 1751 | GAGCTCGCGA ATACTTCGAG CCACTGACCA ATTTGACTCG TCAACTTGAT CCAACTCGCC CTATTACATT   |   |
| 1821 | A N V G T A T Y Q L D R I S D L F D V S C I N                                  |   |
| 1891 | TGCTAACGTC GGCACGGCA CATACTAGCT GGATCGGATC TCTGATCTGT TTGATGTCAG TTGGCTAAAT    |   |
|      | R Y F G W Y S Q T G D L E E A E A A L E K E L H                                |   |
|      | CGGTATTTCG GATGGTATTC TCAAAACAGGA GACCTTGAGG AAGCAGAGGC AGCTCTTGA AAGGAGCTGC   |   |
|      | G W Q E K F H R P I V M T E Y G A D T L A G L                                  |   |
|      | ATGGATGCC AGAGAAATTG CACAGGCCGA TCGTCATGAC CGAATATGGT GCAGATAACC TTGCAAGGCC    |   |
|      | H S I L G L P W S E E F Q V Q M L D M Y H R V                                  |   |
|      | TCACTCTATC CTGGACTGCG CTTGGAGGCCA AGAGTTCCAA GTACAAATGC TAGACATGTA CCATGGAGTGC |   |
|      | F D R I E S M A G E H V W N F A D F Q T N L G I                                |   |
|      | TTTGTATGCCA TTGAGTCGAT GGCAGGGCAG CATGGTTGGA ACTTTCGCCGA TTTCAGACAC AACTGGGTA  |   |

*Figure 3C*

## Figure 4A

### *Penicillium canescens* strain DSM1215

MetLysPheLeuThrArgLeuSerLeuLeuSerLeuAlaAlaPro  
ATGAAATTCTTACCGCATTGCGCTGCTATCTCTGCTGCTCCA

SerLeuGlyThrProAlaAlaArgHisPheProArgAsnGluMet  
TCGTTGGGTACACCTGCAGCTCGGCACTTCCACGCAATGAAATG

XaaGlnAsnGleGlnProLeuIleLysIleArgProGlnArgThr  
ATCCAAAATGAACAGCCCTTGATCAAATCAGGCCAACGAACT

SerSerArgAspLeuValAsnLeuAspGlyLeuTrpLysPheAla  
TCATCTCGAGACCTTGTGAACCTTGATGGTCTATGGAAATCGCC

LeuAlaSerGlyProAsnAspThrAlaGlnProTrpThrAlaPro  
CTCGCATCTGGCCCCAATGACACGGCCCAGCCGTGGACAGCGCCA

LeuProLysGlyLeuGluCysProValProAlaSerTyrAsnAsp  
TTACCCAAAGGTCTTGAATGTCCAGTCCCAGGCTTACAATGAC

IlePheIleSerArgGluIleHisAspHisValGlyTrpValTyr  
ATTTCATCAGCCGGGAGATCCACGACCATGTGGATGGGTTAC

TyrGlnArgGluValIleValProLysGlyTrpSerGlnGluArg  
TATCAGCGTGAGGTATTGTCCCCAAAGGCTGGTCTCAGGAGCGA

TyrLeuValArgAlaGluSerAlaThrHisHisGlyArgIleTyr  
TATCTTGTGCGAGCCGAATCCGCTACACACCAGGTGCATCTAT

ValAsnAsnArgLeuValAlaGluHisValGlyGlyTyrThrPro  
GTCAACAAACGGCTTGTGGAGCATGTGGCGGCTATACACCT

PheGluAlaAspIleThrAspLeuValValProGlyGluLysPhe  
TTTGAAGCCGACATCACTGATTGGTCCCTGGAGAGAAATT

ArgLeuThrIleGlyValAsnAsnGluLeuThrHisGluThrIle  
CGTTTGACGATTGGTGTCAACAACAGAGCTTACCCATGAGACTATC

ProProGlyGluIleThrThrAlaAsnAlaThrGlyLysArgIle  
CCACCAGGAGAAATCACACAGCGAACGCGACTGGCAAGAGAAC

GlnThrTyrGlnHisAspPheTyrAsnTyrAlaGlyLeuAlaArg  
CAGACCTATCAACATGACTTTACAACATGCCGGTCTGCCCGA

SerIleTrpLeuTyrSerValProGlnGlnHisIleGlnAspIle  
TCTATCTGGCTTATTCTGTACCCAGCAACATATCCAGGATATT

## Figure 4B

ThrValValThrAspValAspGlyAspAsnGlyLeuIleAsnTyr  
ACTGTGGTTACAGATGTTGATGGTACAATGGTCTGATCAACTAC

GluValGluValAlaAsnGlnThrThrGlyGlnIleGlnIleSer  
GAGGTCGAAGTGGCGAACCGAGACGACGGGGCAGATCCAGATCTCA

ValIleAspGluAspGlyAlaIleValAlaAsnAlaSerGlyAla  
GTGATCGACGAGGATGGAGCTATTGTTGCAAATGCCTCGGGAGCT

GlnGlyThrValThrIleProSerValLysLeuTrpGlnProGly  
CAGGGTACTGTCACAATTCCCTCAGTCAAGCTATGGCAACCTGGC

AlaAlaTyrLeuTyrGlnLeuGlnValAsnValValAspSerSer  
GCCGCATATCTCTACCAACTCCAGGTCAACGTCGTGGATTCTAGC

GlyAspValValAspThrTyrAsnLeuAlaThrGlyValArgThr  
GGCGATGTAGTCGACACCTATAATTGGCTACGGCGTGCCTACT

ValLysIleSerGlySerGlnPheLeuIleAsnGlyLysProPhe  
GTCAAGATTCCGGTCACAATTCTTGATAAACGGCAAGCCTTC

TyrPheThrGlyPheGlyArgHisGluAspThrAlaValArgGly  
TACTTACCGGTTTGGCAGGCATGAAGACACAGCAGTACGTGGC

LysGlyHisAspProAlaTyrMetValHisAspPheGlnLeuMet  
AAAGGACATGACCCAGCATATGGTTCACGATTCCAACTCATG

LysTrpIleGlyAlaAsnSerPheArgThrSerHisXaaProTyr  
AAATGGATTGGAGCAAATTCTTCCGGACTTCACACTACCCTTAT

AlaGluGluValMetAspPheAlaAspArgAsnGlyIleValVal  
GCAGAAGAGGTATGGATTCGCAGATCGAAATGGAATTGTCGTG

IleAspGluThrProAlaValGlyLeuAsnIleAlaLeuMetGly  
ATCGATGAAACTCCTGCCGTGGTCTGAACATTGCCTGATGGGT

ValSerGluSerGlyAlaProGlnThrPheThrProAspGlyIle  
GTATCTGAGAGTGGTGCCCCACAAACATTACGCCAGATGGGATT

AsnAspLysThrGlnGluAlaHisLysGlnAlaIleArgGluLeu  
AACGATAAGACCCAAGAGGCCACAAACAGGGCATTGAGCTC

IleAlaArgAspLysAsnHisAlaSerValValMetTrpSerIle  
ATTGCCCGAGACAAAAACATGCCAGTGTGTCATGTGGTCTATT

## **Figure 4C**

AlaAsnGluProAlaSerGlnGluAspGlyAlaArgGluTyrPhe  
GCCAATGAGCCTGCATCTCAGGAAGATGGGGCTCGCGAATACTTC

GluProLeuAlaAsnLeuThrArgGlnLeuAspProThrArgPro  
GAGCCACTGGCCAATTGACTCGTCAGCTGATCCAACCTGCCCT

IleThrPheAlaAsnValGlyAlaAlaThrTyrGlnLeuAspArg  
ATTACATTGCTAATGTCGGCGCTGCAACATATCAGCTAGATCGG

IleSerAspLeuPheAspValSerCysIleAsnArgTyrPheGly  
ATCTCTGATCTGTTGATGTTGCATAATCGGTATTCGGA

TrpTyrSerGlnThrGlyAspLeuGluGluAlaGluAlaAlaLeu  
TGGTATTCTCAGACAGGAGACCTTGAGGAAGCAGAGGCAGCTCTT

GluLysGluLeuArgGlyTrpGlnGluLysPheHisArgProIle  
GAAAAGGAGTTGCGTGGGTGGCAAGAGAAATTCCACAGGCCGATC

IleMetSerGluTyrGlyAlaAspThrLeuAlaGlyLeuHisSer  
ATTATGAGCGAATATGGTGCAGATACCCTTGCAGGTCTTCATTCT

IleLeuAlaLeuProTrpSerGluGluPheGlnValGlnMetLeu  
ATCCTCGCACTGCCTTGGAGCGAAGAGTTCCAGGTACAAATGCTA

AspMetTyrHisArgValPheAspArgIleGluSerMetAlaGly  
GACATGTACCATCGAGTGGTGTGATCGCATTGAGTCGATGGCAGGC

GluHisValTrpAsnPheAlaAspPheGlnThrAsnLeuGlyVal  
GAGCATGTTGGAACCTCGCGGATTCCAGACCAACTGGGTGTC

IleArgValAspGlyAsnLysLysGlyValPheThrArgAspArg  
ATCCGAGTAGATGGTAACAAGAAGGGTGTTCACGCGTGACCGA

LysProLysAlaAlaAlaHisSerLeuArgAlaArgTrpThrAsn  
AAGCCAAAGGCGGCAGCTCATAGTTGAGGGCAAGGTGGACGAAT

GlyAspLysAsn  
GGTGATAAGAATTAG

*Figure 5*

### *Giberella zae*

ATGTTGCGACCACAAGCCAACAGGGCTCGGACCTTGTGTCACTAGACGGTGGTTCGAACTTTG  
CCCTCGCAAATCTCACGACATTGAAACTGAGCAAGCATGGAAGAAGCGAATCTCACCAAGAGCT  
TCAAGTACCTGTTCCAGCCAGCTACAACGACATTTGCTGACGAGACCATCCGCGACCACGTC  
GGCTGGGTCTACTATCAGCGTCAAGCAGTTGTTCCCCGCGGTTGGGTTGCGCCTCAGCGTGTCT  
TTCTACGTGTAGATGCTGCAACCCACCACGGCAGAGTTACGTCAACGACAAGTTGTCGTGCGA  
GCATATCGCGGCTATACACCCTTGAGATTGAGCTTACGGACTTGTGCAACCGGGGTGAGAG  
TTTGTCTTACGATTGCTGTGAAACAATCAACTCACATGGGAGACTATTCCGCCGGTGCATTG  
AGGCTCAAAGTGTGGTTCGCGGAAGCAGAGCTACAGCATGACTTTCAACTATGCTGGATT  
GGCCCGTTCTGTGTGGCTTACTCGGTACCAAAGGTCTTATAAATGATATCAGCGTCGGCACA  
GATCTCTGGGGACGGAACCGGCATTGTCGAATTGATATTGGACCTCTGGTGAACCTCAGG  
CTGACGCAAGATGGCGCATCTGCTCGACGACGAAGAGGATGCGACAGTGTGTCAAGCCCAAGA  
GTCACATGGAAAACCTTGAGGTTAAAAACGCTAAATACTGGCACCTGGTGTGCGTACCTTAT  
CAGCTCGGGCTCAGCTCGTACCGCGGAACACCGACGAGATCCTCGACACATATAACCTGCG  
TAGGCATCCGTTAGTCGAGATCCGAGATGGCCGCTTCTCATCAACGGGAAGCCATTATT  
TACCGGCTTGGCAAACACGAAGATGGCCCGTCCGTGGACGCGGTTATGACGCGTACAT  
ATACACGACTACCGTCTGATGAAGTGGATAGGAGCCAACCTTTCCGAAACCTCCACTACCCCT  
ACGCAGAGGAGGTTCTGGAATACTGCCGACAGACACGGCGGGTTATTAAACGAAACAGCCGC  
CGTTGGTCTCAACCTCAATATTGTCTGGGTATGTTGGCAACAAGCAACTTGCCACATTCTCC  
CCGGATAACCATGAGTAGCAAAACACAGGCTTCACATGAACAAGCTATCGTGAGCTTACAGCC  
GGGATAAGAACCAACCTTGTGTGATGTGGATGCTGGCAAATGAGCCTGGGGCAGCGAGCA  
GGGAAGTCGAGAATACTTGAAACCGCTCGTTACCTGGCGGATCGCTGGACAGTCAGAAACGG  
CCAATGTGCTACTCCACATGATCCACTCTAACGCTGATACAGATCGCATCGAGACCTTTG  
ATGTAGTCTGTATGAACCGCTACTACGGGTGGTACACGCAAACAGGAAACCTCAAAGCCGCAGA  
AGTCGCCCTTGAAGCCGAGCTACGCAAGAAGCCTACGCCGCAAACCCATAATCATG  
ACGGAATATGGCACCGACACAGTCGCAGGTCTGCACACCGTTGTGATGTGCCCTGGACTGAAG  
AGTACCCAGGTTCGCTTTGGACATGTATCACCGCGTCTTGACCCGATTGATAATGTCGTGG  
CGAGCATGTGTGGAACTTGTGATTTCCAGACATCGGCTATGATTATTAGGGTTGATGGGAAC  
AAGAAGGGTATCTTACTAGGGATCGCAGGCCAAAGAGTCAGCTCATGCTTGCAGCGAGAT  
GGACTGGGCCTGTTGGACCTCGCAAGATAGAGGTGACCAAGCAATAA

MLRPQANRARDLVS LDGVWNFALAKSHDIETEQAWKKRISP ELQVVPVASYNDIFADETIRDHV  
GWVYYQRQAVVPRGVAPQRVFLRVDAATHGRVYVNDKFVVEHIGGYTPFEIELTGLVEPGSE  
FRLTIAVNNQLTWETI PPPGRIEAQSDGSRKQSYQHDFN NYAGLARSVWL YSVPKVFINDISVGT  
DLLGDGTGIVEFDIRTS GELQADARWRILLDDEEDATVCQAQESHGKLEVNAKYWAPGAAYLY  
QLRAQLVRGEHDEILD TYNLAVGIRSV EIRDGRFFINGKPFYFTGFGKHEDGPVRGRGYDASYM  
IHDYRLMKWIGANSFR TSHYPYAEEVLEYADR HGVVVINETA AVGLNLNIVSGMFGNKQLATFS  
PDTMS SKTQASHEQAI RELIS RDKNHPCVVMWMLANE PGASEQGSREYF EPLVTLARSLDSQKR  
PMCYS HMIHSKPDTDRIADLF DVVCMNRYGYWTQ TGNLKAAEVALEAELRSWQEAYAAKPIIM  
TEYGTDTVAGLHTVCDVPWTEEYQVRF LD MYH RVFDRIDNVVGEH VWNFADFQTSAMIIRVDGN  
KKGIFTRDRRPKSAAH ALRARWTGPVGPRKIEVTKO

## Figure 6

### *Aspergillus nidulans*

ATGAGGGTCTTCCCAGTGTATCTTCTTGTCACTCGCACTCATCCCTCCCTCGCTCGCGTCC  
CGTCGCCTCAGCTCCCGACGTCGAGCTCCGCCAACACAAGCCCTAACCATCAACCTGAA  
ACCCCAGCAGACGTCGACGAGAGACCTCGTTCTCGACGGGCTGTGGTCCTTGCCCTCGAA  
GACGCCACAAACAGCACCTCTGCTCCCTGGACGGCGCGCTCCAAAGGGCCTGGAATGTCCCG  
TCCCTGCATCCTACAAACGACATCTTCGTCGACAGGACCATTCACGATCACGTGGCTGGGTATA  
CTACCAACGCACTGTGACTGTCCCACGGGCTGGCAGATCAGCGCCTTCCTCCGTCTGGAG  
TCAGCAACGCATCATGGCCCGTCTATGTCAATGAGCACCTGGTTGCCGAGCATGTTGGCGGTT  
ACACCCCGTTGAAGCCGACATTACCTCTCGTCAGCCTGGTAAAGCTTCCGGTTGACAAT  
CGGTGTGGACAACCAGCTGACGCACGAGACCATCCCTCCAGGTGATCTGGTACTTCTGAGTAT  
ACAGGGAAAGAACACAGCAGAGCTACCAGCACGACTTTACAATTACGCAGGGCTGGCGAGGTCCA  
TATGGCTCTACTCTGTGCCAAGGATCAGTTCATCAAGGACATCACGGTCGTTCCAGATGTTGA  
TTGGGATGGTACGCAGAGACCGGAGTGGTGGAGCTATAACCGTCAGACTTCTAACGCGACGAGT  
GGCCCCATCCGGATCTCAATTCTCGATGAAGAAGGAAACGAGGTGCAACAGCGTCCGGAGCCA  
CTGGGACAGCTACCATTCCCTCTGTCAACCTCTGGCAGCCTGGCGCTCCCTACCTATACTCCTT  
CACTGTCAGCATCCTCTCCGCCCTCCAAACGGCTGATCGACACATACACACTGCCCATGGTATC  
CGCACTGTGGCTGTCGGCAACGGCACTATCTGGTCAACAATGAGCCGGTCTACCTGACCGGGT  
TTGGCAAACACGAGGATAGTCCCATCCGGCAAAGGCCACGACATCGCGTACCTAGTCCACGA  
CTTCCAGCTGCTGGACTGGATCGCGCGAACTCTTCCGACCAGCCACTATCCTACGCGGAA  
GAGGTGATGGAATTGCAGACCGCCAGGGATTCTTGTCATTGACGAAACGCCCGTCCGGAC  
TGGCGTACAGCATTGGCGGGCATCTCAACGGACACAAGCAGGGTACCTTCGGCGCCGGACGG  
GATCAACAACAATACTCGCGCAGCCCACGCCAGGCTCTCCGGAAACTCATTGACACGGGACAAG  
AACCAACCCAGCGTTATCATGTGGTCATCGCGAACGAAACCGCGTCTGATGAGCCAGGTGCGC  
GCGCATACTTGAGCCCCCTACCGCGCTGCCGCTCCCTCGATCCCGCGCACCGGCCATAAC  
TTTCGCCAACCTCGCCCTGGCAACCTATGAAACCGACACAATCTGACTTGTGATGTTCTC  
TGCCTGAACCGATATTGGCTGGTACTCGTACACGGAGACCTGGAGTCCGGAAAGGCAC  
TCCATGAGGAACGGACGGATGGGTGGCAAGTACCCGACCAAAACCAATCATCATCAGCGAGTA  
CGGGGCAGACACAATGGCGGGACTGCACTCTGTGCTGGACTGATCTGGAGCGAGGAGTTCCAA  
ATCGAGTTGCTGGATGTGTATCATGGGGTGGTCAACAGTCCAGAATGTGGTTGGTGGAGCATG  
TATGGAATTTCGCGGATTCCAACAAAGGAGGGCATACAGCGGGTGGATGGAACAAGAAGGG  
TGTCTTACCAAGAGACCGCAGACCCAAGGGGGCGGCGTTGCCTTGAGGAAGAGGTGGATGAAT  
ATGATGTCGAGTTAG

MRVFPVLSFLSLALIPPSLGVPSQLRDVELPPTQQALTINLKPPQTSTRDLVSLDGLWSFALE  
DATNSTSAPWTAALPKGLECPVPASYNDIFVDRTIHDHGVWYYQRTVTVPRGWADQRAFLRLE  
SATHHGRVYVNEHLVAEHVGGYTPFEADITSLVQPGESFRLTIGVDNQLTHEIIPPGDLVTSEY  
TGKKQQSYQHDFNYAGLARSIWLYSVPKDQFIKDITVVPDVWDGDAETGVSYTVQTSNATS  
GPIRISILDEEGNEVATASGATGTATIPSVNLWQPGAPYLYSFTVSILSASQRLIDTYTLPIGI  
RTVAVGNGTILVNNEPVYLTGFGKHEDSPIRGKHDIAVLVHDFQLLDWIGANSFRSHYPYAE  
EVMEFADRQGILVIDETPAVGLAYSIGAGISTDTSRVTFAPDGINNNTRAHAQALRELIARDK  
NHPSVIMWSIANEPASDEPGARAYFEPLTRLARSLDPAHRPITFANGLATYETDTISDLFDVL  
CLNRYFGWYSYTGDLESAGKALHEELDGWVAKYPTKPIIISEYGADTMAGLHSVGLIWIWSEEFQ  
IELLDVYHGVFDQFQNvvGEHvWNFADFQTKEGIQRVDGNKKGVFRDRPKGAFAFLRKRMN  
MMS

**Figure 7A**

|                                | Pfam   |
|--------------------------------|--|
| <i>Caenorhabditis elegans</i>  | (1) -----MILKPTVLLLLLQSISTITCLH                        |
| <i>Drosophila melanogaster</i> | (1) MHLRIRLTCRKYEIWALSIFSLVTGLYVLHFSIALILVNKEVPQTRGMLY |
| <i>Mus musculus</i>            | (1) -----MSLKWSACWVALGQLLCSCALALKGGMLF                 |
| <i>Rattus norvegicus</i>       | (1) -----MSPRRSVCWFVLGQLLCSCAVALQGGMLF                 |
| <i>Felis catus</i>             | (1) -----MLRGPAAVWAALGPLLWACGLALRGGMLY                 |
| <i>Canis familiaris</i>        | (1) -----MSRGPAGAWVALGPLLWTCGLALEGGMLY                 |
| <i>Cercopithecus aethiops</i>  | (1) -----GLAMAWAVLGPLLWGCALALQGGMLY                    |
| <i>Homo sapiens</i>            | (1) -----MARGSAWAALGPLLWGCALGLQGGMLY                   |
| <i>Sulfolobus solfataricus</i> | (1) -----  |
| <i>Thermotoga maritima</i>     | (1) -----MVR   |
| <i>Lactobacillus gasseri</i>   | (1) -----MESALY  |
| <i>Escherichia coli</i>        | (1) -----MLR   |
| <i>Staphylococcus</i> sp.      | (1) -----MLY   |
| <i>Aspergillus nidulans</i>    | (1) -----MRVFPVLSFLSLALIPPSLGVPSPQLRDVELPPTQQALTINLK   |
| <i>Penicillium canescens</i>   | (1) -----MKFLTGLSLLSLAA--PSLGTPAARHFPRNEMTQHEQPLIKVR   |
| <i>Scopulariopsis</i> sp.      | (1) -----MRLSNIPLLRPWAALSLATLIGLS-SGADTDQWKTLK         |
| <i>Gibberella zeae</i>         | (1) -----MLR   |
| Consensus                      | (1) -----MLY   |
|                                | L L  |

|                                | 02837 →   |
|--------------------------------|---|
| <i>Caenorhabditis elegans</i>  | (1) VQKNEIRTVDSSLGCLWTFVREPHNGGDV[GIVNQWNTLDEERFQNAATVMPV |
| <i>Drosophila melanogaster</i> | (1) ERESETREVRSLLDGIWNEVRSQDQANPTQ[GVRDEWMAKESKSRPTIPMPV  |
| <i>Mus musculus</i>            | (1) EKESPSRELKALLDGLWHEFRADLSNNRRLQ[GFEQWYRQPRESGPVLDMPV  |
| <i>Rattus norvegicus</i>       | (1) EKETPSRELKVLDGLWSPRADYSNNRRLQ[GFEQWYRQPRESGPVLDMPV    |
| <i>Felis catus</i>             | (1) ERESPSRELKEELNGLWSRADFSENRRQ[GFEQWYRTPRESGPVLDMPV     |
| <i>Canis familiaris</i>        | (1) ERESPSRELRKDLDGLWSRADFSDGRQ[GFEQWYRQPRESGPVLDMPV      |
| <i>Cercopithecus aethiops</i>  | (1) ERESQSRELKEELDGLWSRADFSNDRRRQ[GFEQWYRRERESGPVLDMPV    |
| <i>Homo sapiens</i>            | (1) EOEPSRELCKEELDGLWSRADFSNDRRRQ[GFEQWYRREWESGPTVDMMPV   |
| <i>Sulfolobus solfataricus</i> | (1) -MRSFYRPKIDLQCFWKEKIDNEN--TGEENGWYKGLESED---IIYV      |
| <i>Thermotoga maritima</i>     | (1) EQRNKKRKFILNLNGVWNLEVTSK-----DR--P----IAV             |
| <i>Lactobacillus gasseri</i>   | (1) EIQNKYRFNTLMNGTWQFETDPN---SVGLDEGWNLKE[PDP---EEMPV    |
| <i>Escherichia coli</i>        | (1) EVETPTREIJKLKDGLWAEFLDREN--CCIDQRWESALQES--RAIAV      |
| <i>Staphylococcus</i> sp.      | (1) EINTETRGVFDLNLGVNFEKLDYG---KCLEEKWYESKLTDT--ISMAV     |
| <i>Aspergillus nidulans</i>    | (1) EQQTSTRDLVSLDGLWSFALEDA---TNSTSAPWTAALPKG---LECPV     |
| <i>Penicillium canescens</i>   | (1) EORTSSRELVNLDGLWKFALASG---LNDTAOPWTAFLPKG---LECPV     |
| <i>Scopulariopsis</i> sp.      | (1) EQANAIARELLSLDCTWNFALPOSR--EIEEDOGWTSVIPPK--LOIPV     |
| <i>Gibberella zeae</i>         | (1) EQANRARDLVSLLDGLWNEALAKSH--DIETEAOAWKKRISPE--LOQPV    |
| Consensus                      | (1) P S SREL LDGLW F D S G E QWY L ES LDMPV               |

|                                |   |
|--------------------------------|---|
| <i>Caenorhabditis elegans</i>  | (75) PSAYNDLGTGSEL RDHIGWVWYEKKEFVPLRDRNMR--HVLRFGSVNYF   |
| <i>Drosophila melanogaster</i> | (101) PASYNDITTDN-LRDHVGTWYDRKFFVPRSWSKDQ--RIWLRLFGSVHYE  |
| <i>Mus musculus</i>            | (80) PSSFNDITQEAALRDFIGWVWYEREAAILPWRWTQDTDMRVVLRINSAHYY  |
| <i>Rattus norvegicus</i>       | (80) PSSFNDITQEAELRNFIGWVWYEREAFLPQRWTQDTDRRVVLRINSAHYY   |
| <i>Felis catus</i>             | (80) PSSFNDVGQDRQLRSFVGWVWYEREAATLPPQRWTQDLGTRVVLRIGSAHYY |
| <i>Canis familiaris</i>        | (80) PSSFNDVGQDRQLRSFVGWVWYEREAATLPPRRWSQDPGTRVVLRIGSAHYY |
| <i>Cercopithecus aethiops</i>  | (77) PSSFNDISQDWRLRHFVGWVWYEREAFLPERWTQDLSTRVVLRIGSAHAY   |
| <i>Homo sapiens</i>            | (80) PSSFNDISQDWRLRHFVGWVWYEREAFLPERWTQDLRTRVVLRIGSAHSY   |
| <i>Sulfolobus solfataricus</i> | (43) PASWNEQNPKWD-QFSGIAWYQKDLFVSNDNGNRK--AWMVFEGAGYI     |
| <i>Thermotoga maritima</i>     | (33) PGSWNEQYQDL--CYEEGPFTYKTTFYVPKELSQKH--IRLYFAAVNTD    |
| <i>Lactobacillus gasseri</i>   | (50) PGTFELTTKDRKYYTGDEWYQKDFFIPPSFLKKKE--LYIIRFGSVTHR    |
| <i>Escherichia coli</i>        | (48) PGSFNDQFADADIRNYAGNIVWYQRFVFPKGWAG-QR--IVLRFDAVTHY   |
| <i>Staphylococcus</i> sp.      | (47) PSSYNDITGVTEIRNHIGYIVWYEREFITVPAFLKDQR--IVLRFGSATHK  |
| <i>Aspergillus nidulans</i>    | (87) PASYNDIFVDRTIHDHVGVWVYQRTVTVPGRWAD-QR-AFLRLESATHH    |
| <i>Penicillium canescens</i>   | (85) PASYNDIFISREIHHDHVGVWVYQRFVIVPKGWSQ-ER--YLVRAESATHH  |
| <i>Scopulariopsis</i> sp.      | (81) PASYNDIFTDPAIRNNVGWVYQRFVQTMSE-GR--YYVRFDSVTHE       |
| <i>Gibberella zeae</i>         | (48) PASYNDIFADETIRDHVGVWVYQRFQAVVPRGVWAPQR-VFLRVDAATHH   |
| Consensus                      | (101) PSSFNDI D LR FVGVWVWYERE VP WSQ VVLR GSA HY         |

**Figure 7B**

|                                |       |   |
|--------------------------------|-------|---|
| <i>Caenorhabditis elegans</i>  | (75)  | AVVYINSEKMTSHICGHILPFEVDISAQIKF@AENK---FTVAVNNLWSWS   |
| <i>Drosophila melanogaster</i> | (101) | AYVWINGQKVVKHEMCHILPFEAEVTDILLSYCAENR---ITVMCDNALIQT  |
| <i>Mus musculus</i>            | (80)  | AVVWVNGIHVEHICGHILPFEADISKLVQSC@PLTT-CRITIAINNTLTTPH  |
| <i>Rattus norvegicus</i>       | (80)  | AVVWVNGIHVEHICGHILPFEADISKLVQSC@PLTT-CRITIAINNTLTTPH  |
| <i>Felis catus</i>             | (80)  | AIWVWNGVHVAEHICGHILPFEADISKLVQSC@PLAS-CRITIAINNTLTTPH |
| <i>Canis familiaris</i>        | (80)  | AIWVWNGVHVAEHICGHILPFEADISKLVQSC@PLSS-CRITIAINNTLTTPH |
| <i>Cercopithecus aethiops</i>  | (77)  | AIWVWNGVHTLICGHICYLPEADISNLVQVC@PLSSHVRITIAINNTLTST   |
| <i>Homo sapiens</i>            | (80)  | AIWVWNGVDTLICGHICYLPEADISNLVQVC@PLPSRLRITIAINNTLTPT   |
| <i>Sulfolobus solfataricus</i> | (43)  | TKLWINGEYGGTHICGCSFTQFKFPKLKVNENFKIV---VKIDNTPSPY     |
| <i>Thermotoga maritima</i>     | (33)  | CEVFLNGEKVGENHIEYLPEFVDTVGKVKSC@ENELR---VVVENRLKVG    |
| <i>Lactobacillus gasseri</i>   | (50)  | AKVFINCHEVGQHICGCFPLPQVKIISNYINYDQTNR---VTVLVNNELSEK  |
| <i>Escherichia coli</i>        | (48)  | GKVVVNNQEVMEHQGGYTPFEADVTPYVIA@KSVR---ITVCVNNELNWQ    |
| <i>Staphylococcus</i> sp.      | (47)  | AIWVYVNGELVVEHKCGFLPFEAEINNSLRD@MNRV---TVAVDNILDDS    |
| <i>Aspergillus nidulans</i>    | (87)  | GRVYVNEHLVAAEHVCGYTPFEADITSLVQPC@ESFR---LTIGVDNQLTHE  |
| <i>Penicillium canescens</i>   | (85)  | GRIYVNNRLVAAEHVCGYTPFEADVTELVAP@EKFR---LTIGVNNELTHE   |
| <i>Scopulariopsis</i> sp.      | (81)  | AKVYVNDEEVGGHVCGYTPFEVDLTDLVSPC@EQFR---LTAVVNNILTQWQ  |
| <i>Gibberella zeae</i>         | (48)  | GRVYVNDKFVWEHICGYTPFEIELTGLVLEP@SEFR---LTIAVNNOLTWE   |
| Consensus                      | (101) | A VVWNG V EHEGGYLPEADIT LVQ G ITIAVNN LT              |

|                                |       |  |
|--------------------------------|-------|--|
| <i>Caenorhabditis elegans</i>  | (169) | TIPOGDFNYQSVAPRNIS@RILSRLPAGAVKNVGNEDDFNYAGILRSVQI |
| <i>Drosophila melanogaster</i> | (195) | TVPOG---RITEVPNDDGGMITVOS-----YTDFFENYAGIHRSVH     |
| <i>Mus musculus</i>            | (179) | TLPPGTIVYKIDTSMPYK@YFVOD-----TSEDFENYAGIHRSVV      |
| <i>Rattus norvegicus</i>       | (179) | TLPPGTIVYKIDPSMPYK@YFVOD-----ISEDFENYAGIHRSVV      |
| <i>Felis catus</i>             | (179) | TLPPGTILYQDTSKYPK@YFVON-----INEDDFENYAGIHRPVLL     |
| <i>Canis familiaris</i>        | (179) | TLPPGTIVYKIDASKYPK@YFVON-----TYEDDFENYAGIHRPVLL    |
| <i>Cercopithecus aethiops</i>  | (177) | TLPPGTIQYLIDISKYPK@YFION-----TYEDDFENYAGIORSVLL    |
| <i>Homo sapiens</i>            | (180) | TLPPGTIQYLIDTSKYPK@YFVON-----TYEDDFENYAGIORSVLL    |
| <i>Sulfolobus solfataricus</i> | (133) | NLPEAR-----DLNN-----AAEDDFENYGGIHRPVYI             |
| <i>Thermotoga maritima</i>     | (124) | GFPSKVPDSG@HTVGFVGSFPPAN-----EDFEPYGGIIRPVLI       |
| <i>Lactobacillus gasseri</i>   | (144) | AIPCG-----EEILDNGQKLA@P-----YEDDFENYSGIMRNWV       |
| <i>Escherichia coli</i>        | (142) | TIIPPG-----MVITDEN@KKKOS-----YFHDFENYAGIHRSVML     |
| <i>Staphylococcus</i> sp.      | (140) | TLPPG-----LYSERHEEGL@KVRNK-----PNEDDFENYAGIHRPVKI  |
| <i>Aspergillus nidulans</i>    | (181) | TIIPPGD-----LVTSEYT@KKQOS-----YQHDFNYAGIARSIWL     |
| <i>Penicillium canescens</i>   | (179) | TIIPPGK-----ITGNAT@KRIOT-----YQHDFNYAGIARSIWL      |
| <i>Scopulariopsis</i> sp.      | (175) | TIIPPG-----EVVTNEA@KLRD-----YNHDFNYAGIARSVSL       |
| <i>Gibberella zeae</i>         | (143) | TIIPPG-----RIEAQSD@SRKOS-----YQHDFNYAGIARSVWL      |
| Consensus                      | (201) | TLPPG TD G VQ FDFENYAGL RSV L                      |

|                                |       | Pfam00703 →  |
|--------------------------------|-------|--|
| <i>Caenorhabditis elegans</i>  | (169) | MKIP---SVYIQNINIVADHTGS---FFFETAVSSLDC-----VRVE            |
| <i>Drosophila melanogaster</i> | (195) | YTTP---RTFMEEVETVNLSKDAT---VCEVFMVSVSVC@SAANEADNVLQIQ      |
| <i>Mus musculus</i>            | (179) | YTTP---TTYIDDITVITMNEQDI---GLVITYW@ISVQG-----SEHFQLE       |
| <i>Rattus norvegicus</i>       | (179) | YTTP---TTYIDDITVITDVRDV---GLVNYW@ISVQG-----SDHFQLE         |
| <i>Felis catus</i>             | (179) | YTTP---TTYIDDITVITSVNQDT---GLVDMQ@FVEG-----GEHFQLE         |
| <i>Canis familiaris</i>        | (179) | YTTP---TTYIDDITVITVGDQDT---GLVDMQ@FVQG-----SEHFQLE         |
| <i>Cercopithecus aethiops</i>  | (177) | YTTP---TAYIDDITVITVGEHDT---GLVNYQ@SVKG-----SNLFELE         |
| <i>Homo sapiens</i>            | (180) | YTTP---TTYIDDITVITSVEQDS---GLVNYQ@SVKG-----SNLFKLE         |
| <i>Sulfolobus solfataricus</i> | (133) | EFVD-ECHVEDITVYT@KSYGHLK---WEILSECNQR-----FSLR             |
| <i>Thermotoga maritima</i>     | (124) | EF@D-HARFLDITWDTSESEPEK-KL@KVVKV@ESEEAVG-----QEMT          |
| <i>Lactobacillus gasseri</i>   | (144) | LALP@QSQ@TNFKLNYQLANN---KATITM@EANN-----NAEFK              |
| <i>Escherichia coli</i>        | (142) | YTTP---NTWVDITV@V@MAQ@CN---HAS@WDWQVVAN@DVS-----           |
| <i>Staphylococcus</i> sp.      | (140) | YTTP---FTYVEDISV@V@DFNGPT---@T@V@T@VDFQG-----KAETVK        |
| <i>Aspergillus nidulans</i>    | (181) | MSVP@KDQF@K@DITV@VPD@WD@GDAET@V@V@SM@TV@QTSNAT-----SGPIR   |
| <i>Penicillium canescens</i>   | (179) | MSVP---QQH@QDITV@V@D@VG@---N@GLINM@EVE@V@N@Q@-----TGQIQ    |
| <i>Scopulariopsis</i> sp.      | (175) | MSVP---DVHVSPDV@V@T@ENDDEGN---ECT@V@MSVET@CSN-----DTQAR    |
| <i>Gibberella zeae</i>         | (143) | MSVP---KVF@N@D@ISV@G@DLLG@G@---TC@V@EFD@RTS@ELQA-----DARWR |
| Consensus                      | (201) | YTTP TYIDDITV T V D GLV Y I V G L                          |

**Figure 7C**

|                                |       |  |
|--------------------------------|-------|--|
| <i>Caenorhabditis elegans</i>  | (255) | V K M F D G E G S L V Y T G N Q T K -- - S E G Q I S N P K E L W W P E R G - - M G K P D I Y S L E V S     |
| <i>Drosophila melanogaster</i> | (280) | A N I Y D K D G I L V A N A T S D Q K L G C K I L Q V N P V K P W W P Y L M H S E P G Y I Y O L E I K      |
| <i>Mus musculus</i>            | (259) | V Q L L D E D G K V A H G T C N Q -- - G Q L Q V B S A N I L W W P Y L M H E H P A Y M S L E V K           |
| <i>Rattus norvegicus</i>       | (259) | V R L L D E D G K I V A R G T C N E -- - G Q L K V B R A H I L W W P Y L M H E H P A Y L Y S L E V T       |
| <i>Felis catus</i>             | (259) | V R L L D E E G K V I V A Q G T C G R -- - G Q L Q V P N A H I L W W P Y L M H E H P A Y L Y S L E V R     |
| <i>Canis familiaris</i>        | (259) | V Y I L L D E E G K V I V A Q G T C S Q -- - G R I L Q V P N V H I L W W P Y L M H E H P A Y L Y S L E V R |
| <i>Cercopithecus aethiops</i>  | (257) | V R L L D A E N K L V A N G T C I Q -- - G Q L K V B G A R I L W W P Y L M H E H P A Y L Y S L E V R       |
| <i>Homo sapiens</i>            | (260) | V R L L D A E N K V I V A N G T C T Q -- - G Q L K V B G V S I L W W P Y L M H E H P A Y L Y S L E V Q     |
| <i>Sulfolobus solfataricus</i> | (196) | F K I V D K E C R V I L N E E S S N E - V F E K D V N N V I P W S P -- - D N P Y I Y T L I V E             |
| <i>Thermotoga maritima</i>     | (206) | I K I G E E E K K -- - I R T S N R F V E C E F I L E N A R F W S L -- - E D - - P Y I Y P L K V E          |
| <i>Lactobacillus gasseri</i>   | (216) | V T I F D N Q K E V A C A T S K N T -- - S S I T I K N P H L W S P N -- - D P M S Y K I K I E              |
| <i>Escherichia coli</i>        | (214) | V E L R D A D Q Q V V A T G Q G T S -- - G T L Q V V N P H L W Q P -- - G - E G Y I Y E L C V T            |
| <i>Staphylococcus</i> sp.      | (217) | V S V V D E E G K V V A S T E C L S -- - G N V E I P N V I L W E P -- - L N T Y I Y Q I K V E              |
| <i>Aspergillus nidulans</i>    | (261) | I S I L D E E G N E V A T A S C A T -- - G T A T I E S V N L W Q P -- - G - A P M I Y S F T V S            |
| <i>Penicillium canescens</i>   | (254) | I S V I D E D G A I V A K A S C A Q -- - G T V T I E S V K L W Q P -- - G - A A Y L Y Q L Q V N            |
| <i>Scopulariopsis</i> sp.      | (251) | V T I L D E D G N E V A E A S E L E -- - G S L N V S P V N L W Q P -- - G - A A Y L Y T L R V E            |
| <i>Gibberella zaeae</i>        | (220) | I L L D D E E D A T V C Q A Q E S H -- - G K L E V K N A K Y W P -- - G - A A Y L Y Q L R A Q              |
| Consensus                      | (301) | V L L D E E G K V V A G T G G L V P N L W P A Y L Y S L V  |

|                                |       | Pfam02836 →   |
|--------------------------------|-------|---|
| <i>Caenorhabditis elegans</i>  | (255) | L I L D G - - E L A D I M R E Q F G F R T V T W S D S Q I F I N S K P F Y C L G F G M H E D F E T     |
| <i>Drosophila melanogaster</i> | (280) | L I A T N D - - E L L D V M R E L K V G I R T L S W N S O Q F L I N G K P F Y E Q G V N K H E D S D T |
| <i>Mus musculus</i>            | (259) | V T T T E S - - V T D Y Y T L P V G I R T V A V T K S K F L I N G K P F Y E Q G V N K H E D S D T     |
| <i>Rattus norvegicus</i>       | (259) | M T T P E S - - V S D F Y T L P V G I R T V A V T K S K F L I N G K P F Y E Q G V N K H E D S D T     |
| <i>Felis catus</i>             | (259) | L T A Q T A A G V S D F Y T L P V G I R T V A V T E H O F L I N G K P F Y E H G V N K H E D A D T     |
| <i>Canis familiaris</i>        | (259) | L T A Q M A A G P V S D F Y T L P V G I R T V A V T E R O F L I N G K P F Y E H G V N K H E D A D T   |
| <i>Cercopithecus aethiops</i>  | (257) | L T A Q T S L G P V S D F Y T L P V G I R T V A V T E S O F L I N G K P F Y E H G V N K H E D A D T   |
| <i>Homo sapiens</i>            | (260) | L T A Q T S L G P V S D F Y T L P V G I R T V A V T K S O F L I N G K P F Y E H G V N K H E D A D T   |
| <i>Sulfolobus solfataricus</i> | (196) | M Y V G G N - - L K D S V Y E R I G F R D V E V K D G K I Y L N G K P I F L K G F G R H E D F P T     |
| <i>Thermotoga maritima</i>     | (206) | L E K - - - - - D E V T P L D I G I R T I N S W D E K R L Y L N G K P V F L K G F G R H E E F P V     |
| <i>Lactobacillus gasseri</i>   | (216) | M L E D G - - - K T V D E Y T D K I G I R T V K I V N D K I L L N N H P I M L K G F G K H E D F N V   |
| <i>Escherichia coli</i>        | (214) | A K S - - - Q T E C D I M P L R V G I R T S V A V K G E O F L I N H K P F Y E T G F G R H E D A D L   |
| <i>Staphylococcus</i> sp.      | (217) | L V N D G - - - L T I D V Y E E P F G V R T V E V N D G K F L I N N K P F Y E K G F G K H E D T P T   |
| <i>Aspergillus nidulans</i>    | (261) | I L S A - S - Q R L I D T Y T L E I G I R T V A V G N G T I L V N N E P V M L T G F G K H E D S P T   |
| <i>Penicillium canescens</i>   | (254) | I V G S - S - G D V V D T Y N L A T G V R T V K V A G S O F L I N G K P F Y E T G F G K H E D T A V   |
| <i>Scopulariopsis</i> sp.      | (251) | L S - - D - D T V V D T Y D L P V G V R S V R V E G N O F L I N G K P F Y E T G F G K H E D S P V     |
| <i>Gibberella zaeae</i>        | (220) | L V R G E H - D E I I D T Y N L A V G I R S V E I R D G R E F I N G K P F Y E T G F G K H E D G P V   |
| Consensus                      | (301) | L V D Y T L P V G I R T V A V Q F L I N G K P F Y F G F G K H E D A D I                               |

|                                |       | Signature1  |
|--------------------------------|-------|---|
| <i>Caenorhabditis elegans</i>  | (347) | I G R G E N Q A I M T K D L N I L E L W M C G N C Y R T T H Y P Y S E E R M F E N D R R G I A V I V E     |
| <i>Drosophila melanogaster</i> | (378) | R G K G F D L D N A I M V R D F N I L L K W I G A N A Y R T S H Y P Y S E E S M Q F A D E H G I M I I D E |
| <i>Mus musculus</i>            | (353) | R G K G F D W P I L L V K D F N I L L R W L G A N S F R T S H Y P Y S E E V L Q L C D R Y G I V V I D E   |
| <i>Rattus norvegicus</i>       | (353) | R G R G F D W P I L L I K D F N I L L R W L G A N S F R T S H Y P Y S E E V L Q L C D R Y G I V V I D E   |
| <i>Felis catus</i>             | (356) | R G K G F D W P I L L V K D F N I L L R W L G A N A F R T S H Y P Y A E E V M Q L C D R Y G I V V I D E   |
| <i>Canis familiaris</i>        | (356) | R G K G F D W P I L L V K D F N I L L R W L G A N A F R T S H Y P Y A E E V M Q L C D R Y G I V V I D E   |
| <i>Cercopithecus aethiops</i>  | (354) | R G K G F D W P I L L V K D F N I L L R W L G A N A F R T S H Y P Y A E E V L Q M C D R Y G I V V I D E   |
| <i>Homo sapiens</i>            | (357) | R G K G F D W P I L L V K D F N I L L R W L G A N A F R T S H Y P Y A E E V M Q M C D R Y G I V V I D E   |
| <i>Sulfolobus solfataricus</i> | (287) | L C K F T Y G A V L V R D E Y I L M R K I G A N S F R T S H Y P Y S N E H L D L A D E M G F L V I L E     |
| <i>Thermotoga maritima</i>     | (290) | L G Q C T F Y P L M I K D F N I L L K W I T A N S F R T S H Y P Y S E E W L D L A D R L G I V I V I D E   |
| <i>Lactobacillus gasseri</i>   | (305) | L C K A V N E S I I K R D Y E C M K W I G A N C F R S S H Y P Y A E E W Y Q Y A D K Y G F L I I D E       |
| <i>Escherichia coli</i>        | (302) | R G K G F D N V L M V H D A I M D W I G A N S Y R T S H Y P Y A E E M L D W A D E H G I V V I D E         |
| <i>Staphylococcus</i> sp.      | (306) | N G R G F N E A S N V M D F N I L K W I G A N S F R T A H Y P Y S E E L M R L A D R E G I V V I D E       |
| <i>Aspergillus nidulans</i>    | (351) | R G K G H D I A Y L V H D F O L L D W I G A N S F R T S H Y P Y A E E V M F A D R Q G I V I V I D E       |
| <i>Penicillium canescens</i>   | (344) | R G K G H D P A Y M V H D F O L M K W I G A N S F R T S H Y P Y A E E V M D F A D R N G I V V I D E       |
| <i>Scopulariopsis</i> sp.      | (340) | R G K G Y D P A Y M I H D B E L M K W M G A N S F R T S H Y P Y A E E V M E Y A D R H G I V V I D E       |
| <i>Gibberella zaeae</i>        | (311) | R G R G Y D A S Y M I H D Y R E L M K W I G A N S F R T S H Y P Y A E E V L E Y A D R H G V V V I N E     |
| Consensus                      | (401) | R G K G F D A L L V K D F N L L K W I G A N S F R T S H Y P Y A E E V M L A D R Y G I V V I D E           |

**Figure 7D**

|                                |       |                                      |                                |
|--------------------------------|-------|--------------------------------------|--------------------------------|
| <i>Caenorhabditis elegans</i>  | (347) | TPAVG LKGFSKANN-----                 | -----NLHVVKMLQDMIDRDKN         |
| <i>Drosophila melanogaster</i> | (378) | CP---SVDTENFSQ-----                  | ELLGKHKSSLEQLIHRDRN            |
| <i>Mus musculus</i>            | (353) | CPGVGIVLPQSFGN-----                  | ESLRHELEVMEELVRRDKN            |
| <i>Rattus norvegicus</i>       | (353) | CPGVGIVLPQSFGN-----                  | VSLRHELEVMDDELVRRDKN           |
| <i>Felis catus</i>             | (356) | SPGVGIVLVEVESYN-----                 | VSLQHHELEVMEELVRRDKN           |
| <i>Canis familiaris</i>        | (356) | SPGVGIMLVQSYSN-----                  | VSLQHHELEVVMDELVRRDKN          |
| <i>Cercopithecus aethiops</i>  | (354) | CPGVGLALPQFFNN-----                  | VSLQNEMRVMEEVVRDKN             |
| <i>Homo sapiens</i>            | (357) | CPGVGLALPQFFNN-----                  | VSLHHHEMQVMEEVVRDKN            |
| <i>Sulfolobus solfataricus</i> | (287) | PPLCYSNISRVMSQEE-----                | IAKMFQGDVKYFEKVRDTIKEFMRQHKN   |
| <i>Thermotoga maritima</i>     | (290) | APHVGITRYH-----                      | YN-----PETQKIAEDNIRRMIDRHKN    |
| <i>Lactobacillus gasseri</i>   | (305) | VPAVGLNRSITNFLNVTSNQSHFFASKTVPELKKV  | EEQEIKEFMDRDKQR                |
| <i>Escherichia coli</i>        | (302) | TAAVCFNLSLGIGFEAGNPKELYSEEAVNGETQQAE | ELQAIKELIARDKN                 |
| <i>Staphylococcus</i> sp.      | (306) | TPAVGVHNFMMATTGLGEGSE                | -RVSTWEKIRTFEHQDVLRELVSRRDKN   |
| <i>Aspergillus nidulans</i>    | (351) | TPAVGLAYSIGAGISTDSRV                 | -TFAPDGINNNNTRAHQALRELIARDKN   |
| <i>Penicillium canescens</i>   | (344) | TPAVGLNIAL-MGVSESGAPQ                | -TFTPDAINDKTQEAEKQAIRELIARDKN  |
| <i>Scopulariopsis</i> sp.      | (340) | VAAVGLNUGISAGLRGDEPPK                | -TFTEDKVNNETQKTHAQALRELIHRDKN  |
| <i>Gibberella zeae</i>         | (311) | TAAVGLNUNIVSGMFGNQLA                 | -TFSPDTMSSKTQASHEQAIRELISRRDKN |
| Consensus                      | (401) | PAVGL L N T H IRELI RDKN             | *                              |

|                                |       | Signature2             |                             |
|--------------------------------|-------|------------------------|-----------------------------|
| <i>Caenorhabditis elegans</i>  | (427) | HPSVIAWSLNEPQTMKKESRN  | YFKTIVDTAHGIDR-TRPVITVYGP-T |
| <i>Drosophila melanogaster</i> | (458) | HPSVVMWSIANEERTGVS     | ADSYELVANFIRS               |
| <i>Mus musculus</i>            | (436) | HPSVVMWSVANEPESSALKP   | AYYFKTIVTHIKALDL            |
| <i>Rattus norvegicus</i>       | (436) | HPSVVMWSVANEPEVSLKP    | AGYFKTIVIAHJKALDP           |
| <i>Felis catus</i>             | (439) | HPSVVMWSVANEPEASFLKP   | AGYFKTIVIAHJKALDP           |
| <i>Canis familiaris</i>        | (439) | HPSVVMWSVANEPETSFLKP   | AYYFKTIVIAHJKALDP           |
| <i>Cercopithecus aethiops</i>  | (437) | HPSVVMWSVANEPEASHLES   | AGYFKLKVITHIKALDP           |
| <i>Homo sapiens</i>            | (440) | HPSVVMWSVANEPEASHLES   | AGYFKLKVIAHJKSLDP           |
| <i>Sulfolobus solfataricus</i> | (380) | RPSVIMYSVMNEP          | PSDIREVAEFIRREVELFKS        |
| <i>Thermotoga maritima</i>     | (372) | RPSVIMYSVMNEP          | PSDIREVAEFIRREVELFKS        |
| <i>Lactobacillus gasseri</i>   | (405) | RPSVIMWSVANEPESNHPD    | AEGFFKALYETANEMDR           |
| <i>Escherichia coli</i>        | (402) | RPSVIMWSVANEPESTTQESYD | YFKDIFAFARKLDP              |
| <i>Staphylococcus</i> sp.      | (404) | RPSVIMWSVANEPESTTQESYD | YFKDIFAFARKLDP              |
| <i>Aspergillus nidulans</i>    | (450) | RPSVIMWSIANEAAATEEEG   | YFKPLVELKELDPQKRPV          |
| <i>Penicillium canescens</i>   | (442) | RPSVIMWSIANEAAATEEEG   | YFKPLVELKELDPQKRPV          |
| <i>Scopulariopsis</i> sp.      | (439) | RPSVIMWSIANEAAATEEEG   | YFKPLVELKELDPQKRPV          |
| <i>Gibberella zeae</i>         | (410) | RPSVIMWSIANEAAATEEEG   | YFKPLVELKELDPQKRPV          |
| Consensus                      | (501) | HPSVVMWSVANEPE         | S A YFK LI TKALDP TRPVTFV   |

|                                |       |                       |                                    |
|--------------------------------|-------|-----------------------|------------------------------------|
| <i>Caenorhabditis elegans</i>  | (427) | -NFDNDQTADLMDFITCVNRY | YGWYIDMG-YIPWINQSVYWDISLWRETFH     |
| <i>Drosophila melanogaster</i> | (458) | -SNTQDKAGRSLDITISFNRY | NAWYSNAG-RIDDMITQVIDEAIAMWKRN      |
| <i>Mus musculus</i>            | (436) | -KYDADLCA             | PYVDVICVNSYFSWYHDYG-HL             |
| <i>Rattus norvegicus</i>       | (436) | -RYDADMGA             | PYVDVICVNSYFSWYHDYG-HL             |
| <i>Felis catus</i>             | (439) | -NYEADLCA             | PYVDVICVNSYFSWYHDYG-HM             |
| <i>Canis familiaris</i>        | (439) | -NYEADLCA             | PYVDVICVNSYFSWYHDYG-HM             |
| <i>Cercopithecus aethiops</i>  | (437) | -NYAADKGA             | PYVDVICLNSYFSWYHDYG-HL             |
| <i>Homo sapiens</i>            | (440) | -NYAADKGA             | PYVDVICLNSYFSWYHDYG-HL             |
| <i>Sulfolobus solfataricus</i> | (380) | --SVRDLALEYV          | DVVISLNYHGWYTEWG-DIDSGVKVVAI       |
| <i>Thermotoga maritima</i>     | (372) | DERTRDVALKYFDIV       | CVNRYMGWYIYQG-RIEEGLQAEKDI         |
| <i>Lactobacillus gasseri</i>   | (405) | -GPKVDKLHPLCDFV       | CLNRYMGWYVAGGPEIVNAKKM             |
| <i>Escherichia coli</i>        | (402) | -DAHTDTISDLFDV        | LCLNRYMGWYVQSG-DLTAEKVI            |
| <i>Staphylococcus</i> sp.      | (404) | -TPETDKV              | ELIDVIALNRYNGWYFDGG-DLTAAKVH       |
| <i>Aspergillus nidulans</i>    | (450) | -TYETDTISDLFDV        | LCLNRYFGWYSYTG-DLTASAGKAL          |
| <i>Penicillium canescens</i>   | (442) | -TYQLDRISDLFDV        | SCINRYFGWYSQTG-DLTAEAAAE           |
| <i>Scopulariopsis</i> sp.      | (439) | -TVDKCLISDLFD         | FLSLNRYMGWYVQTG-DL                 |
| <i>Gibberella zeae</i>         | (410) | -KPDTDRIDLF           | DVVCMNRYMGWYTQG-NL                 |
| Consensus                      | (501) | YD D GA               | VDVICLNRYYGWY D G LE A L ELE W K Y |

**Figure 7E**

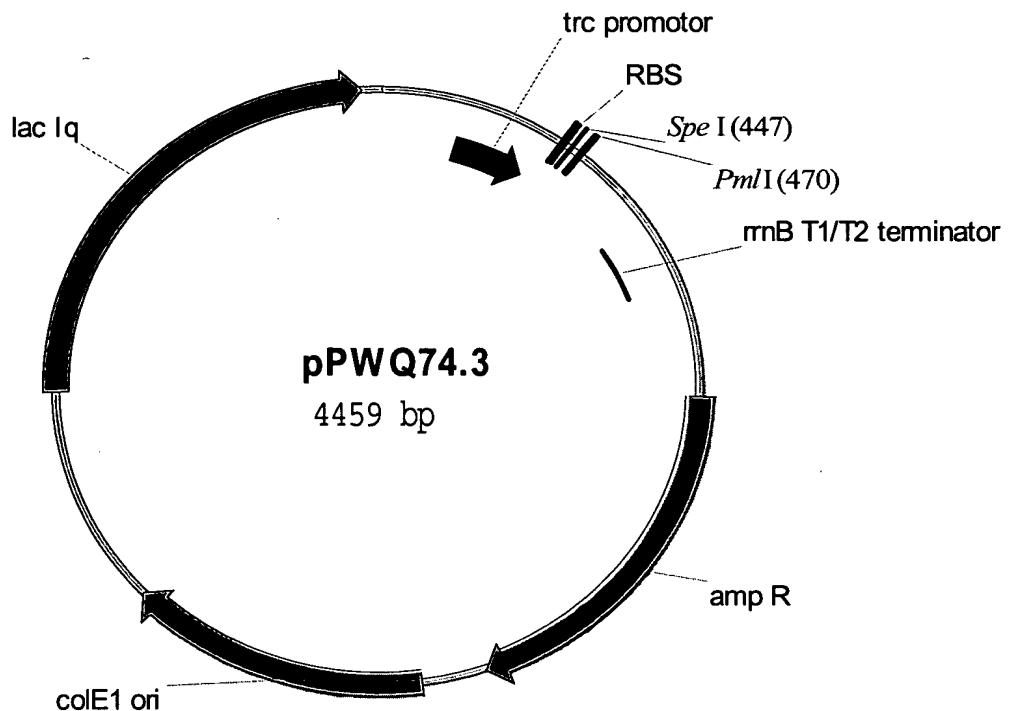
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|                                |       |  |
|--------------------------------|-------|--|
| <i>Caenorhabditis elegans</i>  | (522) | -KPIIIVTBYCADSIPGLNQEE SVDFSEQYONEVIQET HAFDALVKDHTI           |
| <i>Drosophila melanogaster</i> | (552) | -KPIIIMS BYCADTILEGLHMQ PAVVWSBEFOTEVFSRHFKA FDELRKKGWF        |
| <i>Mus musculus</i>            | (530) | -KPIIQS BYGADAI PCIHEDP P R MFSBEYOKAVLEN YSMLDQKRKE-YV        |
| <i>Rattus norvegicus</i>       | (530) | -KPIIQS BYGADAVS GLHEDP P R MFSBEYOTALLENYH LILDEKRKE-YV       |
| <i>Felis catus</i>             | (533) | -KPIIQS BYGADTIIAGFHQDPPLMFSEYYOKGLLEQYHMLDQKRKE-YV            |
| <i>Canis familiaris</i>        | (533) | -KPIIQS BYGAEIIAGFHQDPPLMFSEYYOKGLLEQYHMLDQKRKE-YV             |
| <i>Cercopithecus aethiops</i>  | (531) | -KPIIQS BYGAEIIAGFHQDPPLMFTEYYOKSLILEQYHMLDQKRK-YV             |
| <i>Homo sapiens</i>            | (534) | -KPIIQS BYGAEIIAGFHQDPPLMFTEYYOKSLILEQYHMLDQKRK-YV             |
| <i>Sulfolobus solfataricus</i> | (473) | EKPIIIITEF GADAIYGLHSDPPQWSEYYOSEMIRK MIEALREKDYI---           |
| <i>Thermotoga maritima</i>     | (470) | -KPIFV TBEFGADAIAGIHYDPPQMFSEYYQAEVKTIRLLLKKDYI---             |
| <i>Lactobacillus gasseri</i>   | (503) | NKPFVFTBEFGADTILSSSERLDEMW S Q EYONEYYQMMYFDIEKKY PFI---       |
| <i>Escherichia coli</i>        | (498) | -QPIIITBYGVDTLAGLHS MYTDWSEYYOCAWLDMYFIRVFD RVS A V---         |
| <i>Staphylococcus</i> sp.      | (501) | GKPIIMTBYGADTIVAGFHDIDPV MTEYYQVEYYQANEVVFDEFENF---            |
| <i>Aspergillus nidulans</i>    | (547) | TKPIIIS BYGADTIVAGLHSVGLI WSEEFQIELL DVYHICVFDQFQNV---         |
| <i>Penicillium canescens</i>   | (538) | -RPIIVMTBYGADTIVAGLHSILGLP WSEEFQVQMLDMYFIRVFDRIESM---         |
| <i>Scopulariopsis</i> sp.      | (535) | -KPIIIMS BYGADTIVAGLHSADLAVDEV L WSEYYQTNLLRMSEK VFD SIDS I--- |
| <i>Gibberella zaeae</i>        | (507) | AKPIIIMTBYGADTIVAGLHTVCDVPWT EYYQVRFLDMYFIRVFD RIDNV---        |
| Consensus                      | (601) | <b>KPIIIS EY GADT IAGLH DPPLMFSEYYQ LLE YH VFD</b>             |

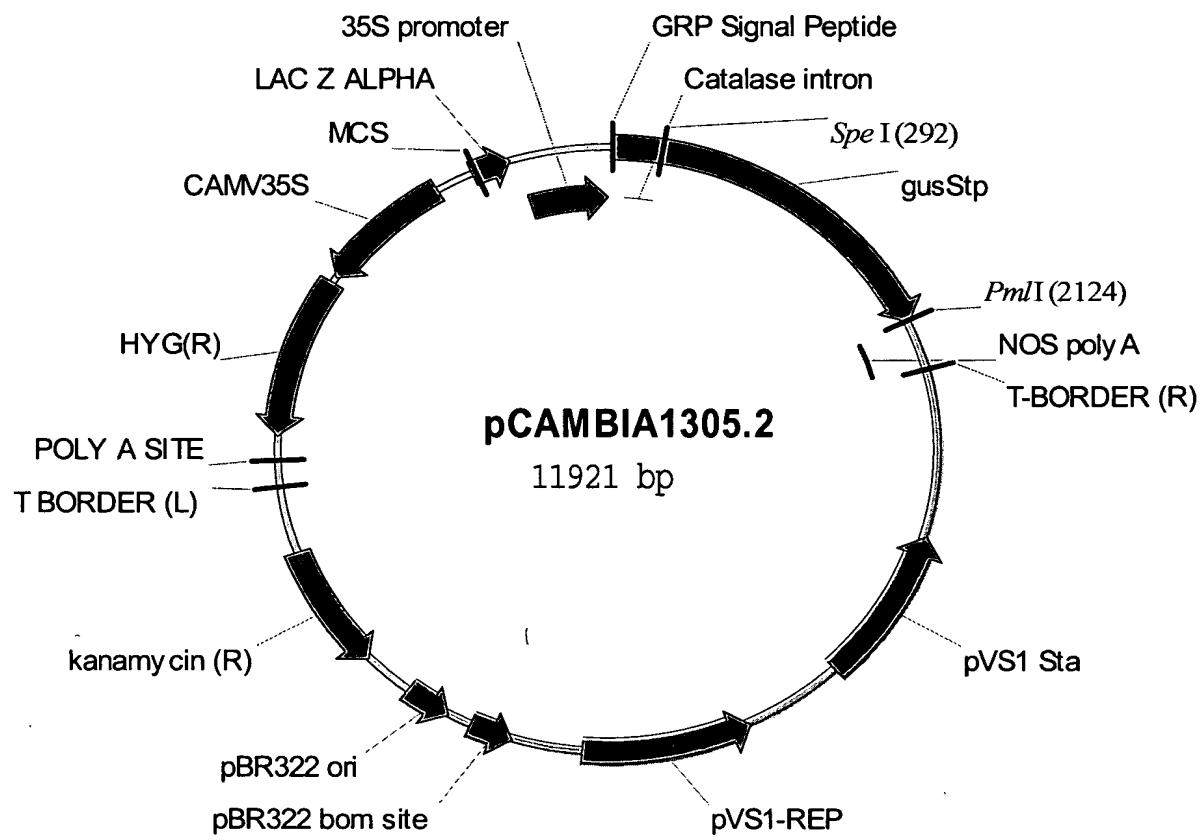
|                                |       |   |
|--------------------------------|-------|---|
| <i>Caenorhabditis elegans</i>  | (522) | TGEMI WNFAD FMT -GMTTT RAVG N H KGV FTR S R OAK I A A Y T L R N R Y L K K G                   |
| <i>Drosophila melanogaster</i> | (552) | IGFV WNFAD FKT -A O S Y T R V G G N K K G V F T R A R O P K A A A H L L R K R Y F A L G       |
| <i>Mus musculus</i>            | (530) | VGELI WNFAD FMT -N O S P L R V I C N K K G I F T R O R Q P K T S A F I L R E P Y W R I A      |
| <i>Rattus norvegicus</i>       | (530) | IGELI WNFAD FMT -N O S P L R V T C N K K G I F T R O R Q P K T S A F I L R E P Y W R I A      |
| <i>Felis catus</i>             | (533) | VGELI WNFAD FMT -N O S P Q R V M G N K K G I F T R O R Q P K G A A E L L R E P Y W K L A      |
| <i>Canis familiaris</i>        | (533) | VGELI WNFAD FMT -D O S P Q R A V G N R K G I F T R O R Q P K A A A E L L R E P Y W K L A      |
| <i>Cercopithecus aethiops</i>  | (531) | VGELI WNFAD FMT -E O S P T R V L C N K K G V F T R O R Q P K S A A E L L R E P Y W K I A      |
| <i>Homo sapiens</i>            | (534) | VGELI WNFAD FMT -E O S P T R V L C N K K G I F T R O R Q P K S A A E L L R E P Y W K I A      |
| <i>Sulfolobus solfataricus</i> | (473) | VG FHI WNFAD FRT -P O N P S R T I L N R K G I F T R D R Q P K L A A K V V E E L F K N K L     |
| <i>Thermotoga maritima</i>     | (470) | IGTHV WA FAD FKT -P O N V R R P I L N H K G V F T R D R Q P K L V A H V L R R L W S E V       |
| <i>Lactobacillus gasseri</i>   | (503) | CGELV WNFAD FKT -S E G I M R V G C N D K G I F T R D R E E K D I A E T I K K E W Q Q L N      |
| <i>Escherichia coli</i>        | (498) | VG E Q V WNFAD FAT -S O G I L R V G G N K K G I F T R D R K E P K S A A E L I Q K E W T G M N |
| <i>Staphylococcus</i> sp.      | (501) | VG E Q A WNFAD FAT -S O G V M R V Q G N K K G V F T R D R K E P K L A A H V F R E R W T N I P |
| <i>Aspergillus nidulans</i>    | (547) | VG E H V WNFAD FQT -K E G I Q R V D G N K K G V F T R D R R P K G A A E A L R K R W M N M M   |
| <i>Penicillium canescens</i>   | (538) | AGE H V WNFAD FQT -N L G I I R V D G N K K G V F T R D R K P K A A A H S L R A R W T S I D    |
| <i>Scopulariopsis</i> sp.      | (535) | VG E H V WNFAD FQT P H T G V N R V D G N K K G V F T R R R P K A A A H E L K R E W L D E G    |
| <i>Gibberella zaeae</i>        | (507) | VG E H V WNFAD FQT -S A M I I R V D G N K K G I F T R D R R P K S A A H A L R A R W T G P V   |
| Consensus                      | (601) | <b>V G E I W N F A D F T Q R V G N K K G I F T R D R R P K S A A H A L R A R W T G P V</b>    |

|                                |       |                        |
|--------------------------------|-------|------------------------|
| <i>Caenorhabditis elegans</i>  | (620) | SNIDTTIWT-----         |
| <i>Drosophila melanogaster</i> | (650) | RDLDQCSFPEDLFTYIADLIS- |
| <i>Mus musculus</i>            | (627) | NETGGHGSGPRTQCFGSRPFTF |
| <i>Rattus norvegicus</i>       | (627) | NETRGYGSVPRTQCMGSRPFTF |
| <i>Felis catus</i>             | (630) | NETRYPWSAVKSQCLENSPFTL |
| <i>Canis familiaris</i>        | (630) | NETGHHRSAAKSQCLENSPFTL |
| <i>Cercopithecus aethiops</i>  | (628) | NETRYPHSIAKSQCLENSPFT- |
| <i>Homo sapiens</i>            | (631) | NETRYPHSVAKSQCLENSPFT- |
| <i>Sulfolobus solfataricus</i> | (569) | RS-----                |
| <i>Thermotoga maritima</i>     | (564) | -----                  |
| <i>Lactobacillus gasseri</i>   | (599) | -----                  |
| <i>Escherichia coli</i>        | (593) | FGEKPQQGGKQ-----       |
| <i>Staphylococcus</i> sp.      | (597) | DFGYKN-----            |
| <i>Aspergillus nidulans</i>    | (643) | SS-----                |
| <i>Penicillium canescens</i>   | (633) | KN-----                |
| <i>Scopulariopsis</i> sp.      | (631) | FPKLGNGTSGA-----       |
| <i>Gibberella zaeae</i>        | (603) | GPRKIEVTKQ-----        |
| Consensus                      | (701) |                        |

**Figure 8**

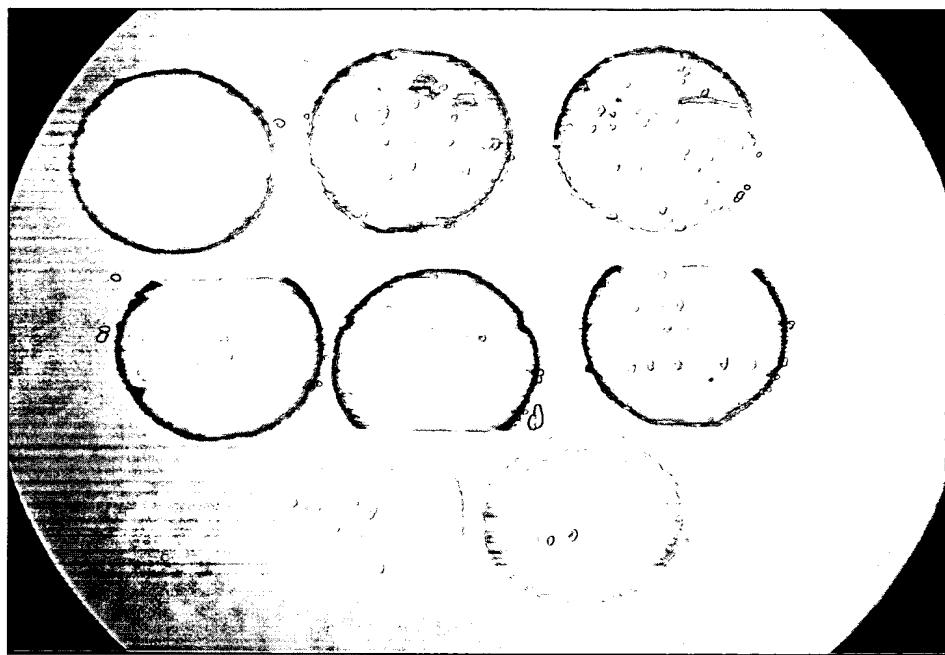


**Figure 9**



**Figure 10A**

$\beta$ -Glucuronidase activity in leaves of rice T1 plants transformed with pPWT9.17



**Figure 10B**

**Secreted  $\beta$ -glucuronidase activity in leaves of rice T1 plants transformed with pKKWA68.4 and pPWT9.17**

pCAMBIA1305.2    pKKWA68.4    pPWT9.17

